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The British Association During the War

On September 1, 1939, Germany's air force and army attacked Poland. Immediately England and France, in fulfilment of their commitments to Poland, declared that a state of war existed between themselves and Germany.

Two days before that fateful September 1, the British Association for the Advancement of Science had assembled at Dundee, Scotland, to hold its one hundred seventh meeting. Although for several months the distant rumblings of war had daily been coming "nearer, clearer, deadlier than before," the Dundee meeting promised to be one of the most successful the British Association had ever held. Only five times have registrations at meetings of the British Association exceeded the 3186 of the Dundee meeting.

On Wednesday Emeritus Professor Sir Albert C. Seward, president of the British Association, delivered a distinguished presidential address on "The Western Isles through the Mists of Ages." As Sir Albert said, "In the rocks we find the soul of history: the whole world throbs with life, and the joy of it all is ours to share." On Friday the evacuation of children from Dundee began, and the scientists regretfully turned from their contemplation of the long and varied history of the Western Isles to the urgencies of the hour.

The sudden ending of the Dundee meeting prevented Dr. Isaiah Bowman, president of The Johns Hopkins University, from delivering the first lecture under an exchange lectureship arrangement that had been entered into between the British and American associations the preceding year. On learning of the termination of the meeting while he was at Perth railway station, a few miles from Dundee, Dr. Bowman crossed the platform to a train southward bound and returned to this country. His address on "Social Science and Pioneering" is published in *The Advancement of Science*, No. 4, July, 1940, pages 552–567.

If the name of the journal in which Dr. Bowman's address was published is unfamiliar, it is because its first issue appeared less than three years ago, in October, 1939, only one month after Great Britain's entry into the war. It is true that the decision by the British Association to change from a large, one-volume "Report" of each meeting, appearing many months after its close, to a quarterly journal was made at the Cambridge meeting in August, 1938. But even then a general European war appeared to be imminent. The steadfastness of the British in holding to their plans may be due to the fact that their evolving social order still endures in spite of the numerous reminders throughout their islands that the Romans and many other invaders have crossed their shores.

Nearly a year after the British had entered the war, and after the Germans had overrun Denmark, Norway, Holland and Belgium, the Division for the Social and International Relations of Science of the British Association announced plans for holding a meeting in Reading. A little later the meeting was transferred to London and postponed until September 26, 27, 28, 1941, the proceedings of which are reported in full in the January, 1942, issue (No. 5) of *The Advancement of Science.*

In addition to the opening and closing sessions of the London meeting, which were presided over by Sir Richard Gregory, president of the British Association, there were six sessions, the general subjects of which were as follows: (1) "Science and Government," Viscount Samuel, Chairman; (2) "Science and Human Needs," American Ambassador J. G. Winant, Chairman; (3) "Science and World Planning," Soviet Ambassador M. Maisky, Chairman; (4) "Science and Technological Advance," Czechoslovakian President Dr. E. Benes, Chairman; (5) "Science and Post-War Relief," Chinese Ambassador Dr. Wellington Koo, Chairman; and (6) "Science and the World Mind," Mr. H. G. Wells, Chairman.

At the opening of the session at which he presided, in the course of a brief address Ambassador Winant said:

"In my judgment the first service that may be rendered by science to human needs at the moment is the integration of scientific method and applied science in support of the allied armed forces that are organizing to destroy Nazi power . . .

"And yet men of progressive minds cannot meet in these troubled times without daring to look beyond war to victory and to peace, and to consider the reestablishment of science in the service of a constructive civilization and with a greater consciousness of the need of international science as the servant of mankind."

The note struck by Ambassador Winant apparently has been heard more frequently in Great Britain than in the United States. Only six months after the first conferences, on last March 20–21, the British Association sponsored a second series of conferences on the relations of science to contemporary social and international problems, the principal theme of which was the post-war reconstruction of European agriculture. Representatives of twelve nations joined in these discussions, which were held under the presidency of Sir John Russell. Four sessions were held, the general subjects of which were: (1) "Measures for Reconstruction"; (2) "Economic and Kindred Problems"; (3) "The Future Betterment of European Farming"; and (4) "Problems of Peasant Farming." The addresses presented at these conferences are printed in full in *The Advancement of Science*, No. 6.

In addition to these international conferences and the establishment by the British Association of the quarterly journal, *The Advancement of Science*, about a year ago The Science Committee of the British Council, under the inspiring leadership of Sir William Bragg, started *Monthly Science News*. This new journal, known simply as MSN, is a four-page publication of about the same format as the A.A.A.S. Bulletin. On its last page there appears an invitation to those who wish to receive succeeding issues free of charge to send their addresses to the Editor, MSN, 3 Hanover Street, London W. 1, England.

The British Association was born in 1831, during the reconstruction period following the Napoleonic wars. As its officers have recently said, in a sense it has been reborn since 1918. Now, during a period of hardships and dangers far exceeding those that people in this country have yet experienced, the British Association is courageously and vigorously taking up the great problems that have arisen largely because of the applications of science, hopeful that these problems can be solved and confident that their solution will be a blessing to mankind.—F.R.M.

Science and Society

We are all aware of how science has transformed so much of our social and individual lives. Through technology, industry, transportation, communication, mining, agriculture, public services, medicine and public health, all have been changed with incalculable consequences for social order and for living generally.

But despite these amazing changes wrought by, or predicated upon, scientific investigation, we are still far from realizing what science means and can mean to society. Scientists, by training, and often by personal inclination, have ignored or shunned these larger questions and left to others, often the less qualified and less responsible, to say what science can and should do and how scientific knowledge should be used.

The time has come, in the opinion of many, when scientists themselves should think more clearly about their rôles, their responsibilities and their opportunities in social life and begin to formulate what they, as scientists, believe to be their social duties and potentialities. Scientists have developed a sensitive scientific conscience that makes them alert to the ethical issues in their scientific work. They have not been so concerned with developing a social conscience, an awareness and concern for what their work means to social life, for the application of their discoveries and for the critical question of where and how their energies and their knowledge might be wisely focussed.

No one interested in these questions is unaware of the many fundamental issues raised by the discussion of science and society. No one can ignore the primary question of protecting scientific inquiry from any coercion or obstruction, from any limitation upon scientific freedom. Consideration of science and society does not mean regimentation of scientists or any kind of overhead regulation and direction, at least not in a democratic free society. It does mean, however, that every scientist should face the larger issues, just as he faces the inescapable moral and ethical issues of his personal life and of his conduct as a member of society.

For the past year or two there has been a progressive concentration of scientific personnel and facilities upon the exigent problems of war—not

merely armaments or military and naval questions, but the whole army of medical, sanitary, nutritional, biological and other questions involved in total war are being intensively studied to find answers to immediate urgent problems. Probably never before has there been such a mobilization of trained, scientific ability upon such definitely focussed goals.

While many scientists naturally have felt some regret when leaving their laboratories and postponing work on their problems, it is safe to say none feels he has been regimented, has had his scientific freedom abridged by being called upon to do war service. Indeed many are probably finding for the first time an indefinable but patent release, a stimulus from the sense of participation in something even bigger than their beloved science.

Now the issue raised by the question of science and society is whether we can begin to formulate the human needs and the possibilities, the social tasks and opportunities, so that they will be of equal significance to those of warfare. Can we muster the same devotion and earnest endeavor for human conservation as we now do for warfare? Can we, as scientists, freely and of our own accord, begin to think of social order as that which must be achieved by striving to attain the kind of group and individual life we believe in and hope for? Scientific knowledge then becomes not merely the source of techniques and instruments, of gadgets, but the basis for organizing social life and achieving the means to human needs and the fulfilments we seek.

If we can translate our present understanding and determination for total war to which we are bending our scientific talents into an equally comprehensive and determined effort at human conservation, will scientists be equally ready to take the lead and devote their minds and their resources to such a program? If so what must science itself do and how can scientists orient themselves to such a task?

When we realize that industrial laboratories for physical and chemical research now receive over ten times as much funds for research as university and associated research organizations, that scientists are being recruited in increasing numbers to such laboratories, is it any more of a regimentation or interference with freedom of scientists to ask them to consider what purposes they are serving in their scientific work, what problems and fields of investigation they give priority to or neglect and to ponder on what responsibility for the use or failure to use scientific knowledge they have?

Science and society is a multi-dimensional problem, calling for study and consideration by many minds capable of illuminating its many facets and its complex interrelationships and far-reaching implications. If we are to have a social order directed by intelligence and guided by scientific knowledge, in place of the folk-lore, the old wives tales and the many baseless prejudices and fears that now play so large a part in social and individual life, scientists must take a more active rôle in focussing scientific study and helping to direct the application of their findings.

What other group can we turn to for understanding and leadership, for the unselfish, altruistic, impartial and intelligent study and planning which are urgently needed, which are essential if we are to achieve a social order dedicated to human needs and asperations? Will the scientists rise to this challenge and assume the responsibilities for which they are uniquely prepared?—LAWRENCE K. FRANK, Chairman of Committee on Science and Society.

Mathematicians Summer Meeting

The American Mathematical Society, the Mathematical Association of America, and the Institute of Mathematical Statistics will meet jointly at Vassar College, Poughkeepsie, N. Y., on September 7 to 9, 1942, inclusive. Two sessions of the Mathematical Association will be held on Monday, September 7, one at 10 a.m. and the other at 2 p.m.

The session of the American Mathematical Society will be held beginning Tuesday forenoon. A series of four colloquium lectures to be delivered by Professor R. L. Wilder of the University of Michigan on "Topology of Manifolds" will be given on Tuesday morning and afternoon and Wednesday and Thursday mornings. On Tuesday at 10:15 a.m. there will be a joint session of the Institute and a section of the Society. On Wednesday afternoon at 2 o'clock Professor W. L. Ayres of Purdue University will give an address entitled "Transformations with Periodic Properties." At 3:15 Tuesday a symposium on statistics as related to the war effort will be held jointly with the Institute of Mathematical Statistics. The speakers will be Dr. H. F. Dodge of the Bell Telephone Laboratories and Professor S. S. Wilks of Princeton University, and discussion will follow.

A joint dinner (informal) of the mathematical organizations will be held Wednesday evening at 6:15 in the dining room of the Main Building. Following the dinner, a concert will be given in

Skinner Hall by members of the Music Department of Vassar College.

Registration Headquarters will be in Main Building and members should report there on arrival for registration and room assignment. The registration office will be open on Sunday after 1 p.m., and from 8 a.m. to 10 p.m. on Monday, from 8 a.m. to 6 p.m. Tuesday and Wednesday, closing at 2 p.m. Thursday. The registration fee for all mathematicians in attendance at the meetings is $1.00, with a fee of 50 cents for each additional adult member of the family. An information desk will be maintained at the registration headquarters, and a directory kept of those in attendance, giving the institutions from which they come and the local address.

Rooms and meals, American plan, for mathematicians, their families and guests will be available in the Main Building. The rate is $4.00 per day. This does not include the special dinner on Wednesday evening, and special arrangements for this meal should be made when one registers. For those who desire hotel accommodations, rooms are available in Poughkeepsie at the Nelson House and Hotel Campbell. Reservations should be made directly with the hotels.

Presidents of the Association

During the 95 years since the Association was founded it has had 93 presidents, including Dr. Arthur H. Compton whose term of office does not expire until the close of the New York meeting next December 28–January 2. Professor William B. Rogers, who was chairman of the committee that organized the Association in 1848 and is often listed as its first president, but is not included here, was regularly elected as its twenty-third president for the year 1876. No meeting was held in 1852 because of an epidemic of yellow fever extending as far north as the Ohio and Potomac rivers, and no meetings were held and no presidents were elected during the period of the Civil War, 1861–1865.

Presidents of the Association have been eminent specialists in a great variety of fields, ranging from mathematics and physics to anthropology and medicine. As the years have passed, the proportion of presidents from various general fields has changed considerably. The number of presidents from each of the fields of the 15 present sections of the Association in each of the three approximately equal intervals, 1848–1879, 1880–1910, 1911–1942 is given in the following table:

Section	*1848–1879*	*1800–1910*	*1911–1942*
Mathematics	2	3	2
Physics	2	4	3
Chemistry	3	4	3
Astronomy	4	3	3
Geology and Geography	10	7	3
Zoological Sciences	2	4	5
Botanical Sciences	2	2	3
Anthropology	1	3	1
Psychology	0	0	2
Social and Economic Sciences	0	1	1
Historical and Philological Sciences	0	0	0
Engineering	0	0	1
Medical Sciences	1	2	4
Agriculture	0	0	1
Education	0	0	1

In the first of the three periods the presidents of the Association include Joseph Henry (1799–1878), who shares with Michael Faraday (1791–1867), the honor of establishing the relations between electricity and magnetism; Benjamin Peirce (1809–1880), the first great American mathematician; B. A. Gould (1824–1896), the founder of the Astronomical observatory at Cordova, Argentina, and the donor of the Gould Fund of the National Academy of Sciences; John Torrey (1796–1873) and Asa Gray (1810–1888), fathers of American botany; and Simon Newcomb (1835–1909), mathematician, astronomer, Director of the American Ephemeris, and a man of such eminence that when scientific men were selected for asterisks for the first (1905) edition of "American Men of Science," by vote of ten men in each science, Dr. Newcomb was placed first by all, as well as Dr. Welch, in pathology, who is mentioned below.

Among the great scientists who were presidents of the Association in the period 1880–1910 there were S. P. Langley, long secretary of the Smithsonian Institution and pioneer in mechanical flight; J. W. Powell, student of Rocky Mountain geology and the first to traverse the Grand Canyon of the Colorado; Edward Morley, chemist and participant in the Michelson–Morley experiment that led to the theory of relativity; R. S. Woodward, mathematician and first president of the Carnegie Institution of Washington; Ira Remsen and William H. Welch, of The Johns Hopkins University, for a generation, dominant leaders in chemical and medical education, respectively, in America; T. C. Chamberlin, president of the University of Wisconsin, head of the Department of Geology of The University of Chicago, and having a worldwide reputation for his work on glaciation and the origin of the earth and other planets; and A. A. Michelson, the first American to receive a Nobel prize.

It is sufficient to mention the names of more recent presidents of the Association, for they are all well known in scientific circles. Those who are deceased are Charles E. Bessey, Edward C. Pickering, Edmund B. Wilson, Charles W. Eliot, W. W. Campbell, Charles R. Van Hise, Theodore W. Richards, John M. Coulter, E. H. Moore, J. Playfair McMurrich, Charles D. Walcott, Michael I. Pupin, Arthur A. Noyes, Henry Fairfield Osborn and John J. Abel. The 16 living past presidents of the Association are Simon Flexner, L. O. Howard, J. McKeen Cattell, Liberty Hyde Bailey, Robert A. Millikan, Thomas H. Morgan, Franz Boas, Henry N. Russell, Edward L. Thorndike, Karl T. Compton, Edwin G. Conklin, George D. Birkhoff, Wesley C. Mitchell, Walter B. Cannon, Albert F. Blakeslee, and Irving Langmuir. As has been stated, the president of the Association for the current year is Arthur H. Compton.—F.R.M.

Some Letters

Your notice of my election as a Fellow of the A.A.A.S. has reached me while on duty with the U. S. Army. My reaction to the honor bestowed upon me resulted in my desire to express a few thoughts which inevitably come to my mind at this occasion.

Like every previous calamity the present struggle for survival is connected with a definite change in the social structure of our society. This time, it appears, the change affects mostly the scientist who, so far, has lived on the island of his laboratory, screened by a Faraday cage against the lightning of exterior events. Now he finds himself projected against a background which follows laws he has never known. His studies, the secure haven of former times, have ceased to give the accustomed comfort. But soon he finds his place among the exigencies of the present when he recognizes that it is, say, the precession of a gyroscope or the effect of reduced atmospheric pressure on the human body which determines the success of a mission, rather than the sound of the drum and bugle. He learns that his previous leisurely observations of the sky with its clouds and stars make him valuable as a navigator through the ocean of air.

If this war requires scientific research on an unprecedented scale, then we need, too, the interpreters of the newly developed principles in order to train and inspire those who do the final job. With the scientist thus in the foremost position of the fight, he must never be allowed to return to his cage. For if he does, there can be no lasting peace.

In the A.A.A.S. I have found an organization which has made it its duty to bridge the gap between the isolation of pure research and the responsibilities toward society. It is indeed a privilege and a source of continued inspiration to be welcome among those who, in all probability, will carry the burden of leadership in our coming form of society.—F. S. VEITH.

You may be interested to know that the annual meeting of the American Roentgen Ray Society will not be held in Atlantic City in October, but at the Palmer House in Chicago, September 15 to 18 inclusive.—H. DABNEY KERR, Secretary, American Roentgen Ray Society.

In these days of increased cooperation between the American and British people it is of interest to note that these two great nations are sharing not only in the vital war effort for the preservation of democracy but in the effort to maintain the tradition of free scientific inquiry.

Dr. H. H. Dale, president of the Royal Society, has written to *The Times* of London expressing the appreciation of British scientists for generous grants made by the American Philosophical and Physiological Societies, and I should like to take the opportunity of expressing in the columns of *The New York Times* still another instance of American generosity.

In 1939 I had the privilege of representing Oxford at the Pacific Science Congress at Stanford University and the University of California. At that time Edward Philpot Mumford, who had been working in my department at Oxford on the collections of the Pacific Entomological Survey, of which he was director, and had held one of the Leverhulme Research Fellowships, was invited by Stanford University to carry on his researches on faunal distribution with particular reference to oceanic islands as a member of the faculty.

These researches, which seek to provide a wider approach to the basic problems of the origin of species, were initiated and carried on in association with my department with the aid of grants through the Higher Studies Fund at Oxford, the British Association for the Advancement of Science, the Royal Society, the British Museum (Natural History) and other organizations.

The project now being completed at Stanford University might, however, have come to an untimely end as a result of the war were it not for the generous support of the Carnegie Corpora-

tion of New York, the National Academy of Sciences, the American Philosophical Society, the American Association for the Advancement of Science, the Society of Sigma Xi, and the May Esther Bedford Fund of Connecticut. To all of these American organizations, as well as to the Chancellor and board of trustees of Stanford University, grateful acknowledgment is here made.—G. D. Hale Carpenter, Oxford University. (Quoted from the *New York Times.*)

There is one unusual result in Association activities that can be traced directly to the A.A.A.S. Bulletin; namely, nominations for the Theobald Smith Award. At this moment we have all of the data, with adequate sponsorship, for seven candidates.—Malcolm H. Soule, Secretary, Section on Medical Sciences.

Affiliated Academy Officers

Doubtless from time to time academy officers, and particularly the secretaries of the academies, find it desirable to communicate with officers of other academies on problems of mutual interest. In order to facilitate and encourage an exchange of correspondence, as well as to comply with several requests, there is listed below the names and addresses of presidents and secretaries of the affiliated state academies of science, including certain organizations affiliated on the same basis as an affiliated academy. The list is up-to-date insofar as the Office of the Permanent Secretary has been informed, although repeated requests during the year to several academies have failed to bring a response. In the list that follows, the name and address of the president is given first, followed by that of the secretary.

Alabama: W. M. Mobley, Alabama By-Products Corporation, Tarrant, Ala.; Winnie McGlamery, Alabama Geological Survey, University, Ala.

British Columbia: W. F. Seyer, University of British Columbia, Vancouver, B. C., Canada; W. John Allardyce, University of British Columbia, Vancouver, B. C., Canada.

Colorado-Wyoming: W. B. Pietenpol, University of Colorado, Boulder, Colo.; Don B. Gould, Colorado College, Colorado Springs, Colo.

Florida: J. F. W. Pearson, University of Miami, Coral Gables, Fla.; J. H. Kusner, University of Florida, Gainesville, Fla.

Georgia: George H. Boyd, University of Georgia, Athens, Ga.; A. S. Edwards, University of Georgia, Athens, Ga.

Illinois State: T. H. Frison, Natural Resources Building, Urbana, Ill.; R. F. Paton, University of Illinois, Urbana, Ill.

Indiana: M. G. Mellon, Purdue University, West Lafayette, Ind.; Winona H. Welch, DePauw University, Greencastle, Ind.

Iowa: C. W. Lantz, Iowa State Teachers College, Cedar Falls, Iowa; E. R. Becker, Iowa State College, Ames, Iowa.

Kansas: R. H. Wheeler, University of Kansas, Lawrence, Kans.; John C. Frazier, Kansas State College, Manhattan, Kans.

Kentucky: J. T. Skinner, Western State Teachers College, Bowling Green, Ky.; Alfred Brauer, University of Kentucky, Lexington, Ky.

Louisiana: William H. Gates, Louisiana State University, Baton Rouge, La.; S. J. P. Chilton, Louisiana State University, Baton Rouge, La.

Maryland: Sebastian Karrer, 2724 N. Charles St., Baltimore, Md.; John C. Patterson, 2724 N. Charles St., Baltimore, Md.

Michigan: H. R. Hunt, Michigan State College, East Lansing, Mich.; H. W. Hann, University of Michigan, Ann Arbor, Mich.

Minnesota: Rodney B. Harvey, University Farm, St. Paul, Minn.; Donald B. Lawrence, University of Minnesota, Minneapolis, Minn.

Mississippi: H. J. Bankston (called to army duty); A. B. Lewis, *Vice President* (Acting President), University of Mississippi, University, Miss.; Clyde Q. Sheely, Mississippi State College, State College, Miss.

Missouri: William C. Korfmacher, St. Louis University, St. Louis, Mo.; R. T. Dufford, University of Missouri, Columbia, Mo.

Nebraska: M. P. Brunig, University of Nebraska, Lincoln, Nebr.; Theo. Jorgenson, University of Nebraska, Lincoln, Nebr.

New Hampshire: Charles D. Howard, State Board of Health, Concord, N. H.; Robert H. Denison, Dartmouth College Museum, Hanover, N. H.

New Orleans: R. A. Steinmayer, Tulane University, New Orleans, La.; Frank G. Mackness, 6037 Freret St., New Orleans, La.

The American Institute of the City of New York: H. C. Parmelee, 310 Fifth Ave., New York, N. Y.; Gerard P. Herrick, 310 Fifth Ave., New York, N. Y.

North Carolina: R. E. Coker, University of North Carolina, Chapel Hill, N. Car.; Bert Cunningham, Duke University, Durham, N. Car.

North Dakota: F. W. Christensen, Agricultural College, Fargo, N. Dak.; G. A. Abbott, University of North Dakota, Grand Forks, N. Dak.

Northwest Scientific Association: J. W. Severy, Montana State University, Missoula, Mont.; H. F. Raup, East Washington College of Education, Cheney, Wash.

Ohio: F. H. Krecker, Ohio University, Athens, Ohio; A. W. Lindsey, Denison University, Granville, Ohio.

Oklahoma: H. I. Featherly, Oklahoma A. and M. College, Stillwater, Okla.; Charles A. Whitmer, Faculty Exchange, Norman, Okla.

Pennsylvania: Charles E. Mohr, The Academy of Natural Sciences, Philadelphia, Pa.; V. Earl Light, Route 1, Annville, Pa.

Academy of Science of St. Louis: W. D. Shipton, Washington University, St. Louis, Mo.; Charles H. Philpot, 6564 Delor St., St. Louis, Mo.

South Carolina: F. W. Kinard, Medical College of South Carolina, Charleston, S. Car.; C. F. Poole, U. S. Vegetable Breeding Laboratory, Charleston, S. Car.

Tennessee: D. M. Brown, State Teachers College, Johnson City, Tenn.; Kendall E. Born, State Division of Geology, Nashville, Tenn.

Texas: E. P. Cheatum, Southern Methodist University, Dallas, Texas; Leo T. Murray, Baylor University, Waco, Texas.

Virginia: Marcellus H. Stow, Washington and Lee, Lexington, Va.; E. C. L. Miller, Medical College of Virginia, Richmond, Va.

Washington (D. C.): Harvey L. Curtis, National Bureau of Standards, Washington, D. C.; Frederick D. Rossini, National Bureau of Standards, Washington, D. C.

West Virginia: Friend E. Clarke, West Virginia University, Morgantown, W. Va.; J. E. Judson, West Virginia Wesleyan College, Buckhannon, W. Va.

Wisconsin: A. W. Schorger, 167 N. Prospect Ave., Madison, Wis.; Loyal Durand, Jr., Science Hall, Madison, Wis.—S.W.

Fluorine and Dental Health

About 25 years ago a peculiar dental anomaly was reported from certain Rocky Mountain areas. A high percentage of the children reared within sharply delimited areas were stigmatized by teeth known by the descriptive term "mottled enamel" or "Colorado brown stain." The classical epidemiological studies of McKay clearly incriminated the domestic water supply, but save for the continuing interest of this lone worker in furthering the knowledge of the geographical distribution of the phenomenon in different parts of the world little attention was paid to it.

In 1931 the work of three groups of investigators working independently pointed to small amounts of fluorides in the water used during the period of tooth formation as the causative factor. This discovery stimulated an unusual amount of interest; today areas of endemic dental fluorosis have been reported from every continent. In the United States alone there are about 400 known endemic areas distributed among 28 states.

Because of the large number of individuals exposed to a determinable constant (a public water supply of known fluoride concentration), endemic dental fluorosis furnished an unusual means of studying physiological effects by the statistical methods of epidemiology. With a degree of precision that is almost mathematical, it has been shown that each increase in the antecedent cause (fluorides in water) results in a commensurate consequent effect (mottled teeth). In the study of human diseases this evidence of concomitant variation is unique.

Endemic dental fluorosis is notable among the major dental diseases as the only one whose prevention has been acceptably demonstrated. But epidemiological observations made during the course of these studies shed such important light on the enigma of dental decay (dental caries) that the original investigation is often lost sight of. During the past few years numerous groups in different fields of science have been engaged in the study of the fluorine-dental caries hypothesis, namely, that certain amounts of fluorides are necessary in order that human teeth shall not decay. Fundamental findings have already been brought to light, findings that hold unusual promise of markedly curtailing this ubiquitous affliction, tooth decay.

Comment on the magnitude of the dental caries problem would seem superfluous. Few escape its attacks. A profession numbering 70,000 members in the United States devotes the greater portion of its time to repairing the ravages of tooth decay or its sequelae. Dental caries is a signal example of a disease with a high attack rate for which no satisfactory methods of control are available. During the past generation discordant and conflicting ideas have been advanced as to the means of controlling dental decay; the fact remains that the highest percentage of selective service men rejected for physical reasons were rejected because of dental defects.

Is fluorine the open-sesame, presaging a marked public health advance in the field of dental hygiene? Will mass control of large population groups in the near future become a possibility? The accumulated evidence is impressive. In the fields of epidemiology, bacteriology, biochemistry, and animal experimentation there is excellent agreement among various dental research workers. It has been shown epidemiologically that school children using domestic waters containing as little as about one part per million of fluorine experience only half to a third as much dental decay as comparable groups using fluoride-free water, such as the Lake Michigan or the Mississippi River waters. Very recently confirmation of this inverse relationship has come from England, Northern India, and South Africa.

Biochemical studies demonstrate that the enamel of caries-free teeth contains about twice as much fluorine as the enamel of carious teeth. Bacteriological studies of oral lactobacilli made on several thousand children in conjunction with the epidemiological studies disclosed that the percentage of high and low counts closely reflected the markedly different caries prevalence rates of the fluoride and fluoride-free communities. A number of independent investigators report a conspicuous reduction in the production of rat molar caries when fluorine is added to the caries-producing diet. Apparently teeth require traces of fluoride for optimum dental health, although excessive amounts may result in the disfiguring condition known as mottled enamel. The difference between 0.0 and 1.0 part per million of fluoride (F) in the domestic water supply has been shown to be highly significant from the standpoint of the amount of dental decay in a community.

If it should be found possible to more than halve the dental caries experience of a community by a simple adjustment of the chemical composition of the public water supply (not to exceed 1.0 part of fluorine per million), reorientation of the problem of dental needs, the future distribution of dental practitioners, the type of dentistry they will be called upon to practice, and other as yet unforseen developments must of necessity follow.

In the short space of a quarter of a century a dental problem affecting a few thousand people in certain western communities of the United States has reached into the far corners of the world. With the passing years its ramifications have extended into epidemiology, water chemistry, sanitary engineering, geology, medicine, nutrition, biochemistry, and veterinary medicine. Its many facets have brought dentistry into coordinative relation with many sciences heretofore thought far removed from the field of dentistry.—H. Trendley Dean.

(Dr. Dean is Dental Surgeon of the U. S. Public Health Service and is a member of the Publication Committee of the volume on Fluorine and Dental Health. This volume is now on the press and will be available for distribution about August 15. Prepublication prices until September 30 next are to members $2.00 and to others $2.50. After that date the prices will be $2.50 and $3.00, respectively.)

Aerobiology

Printed copies of the Symposium on Aerobiology have been delivered by the printers and are now available for distribution. As previously announced, the price to members of the Association is $3.50; to others, $4.

Aerobiology contains 304 pages and is illustrated and cloth bound. The volume is $7 \times 10\frac{1}{2}$ inches, double columns, the same as previous volumes of the symposia series. Altogether there are 37 papers by 55 authors, covering both extramural aerobiology and intramural aerobiology. For a description of the contents of this volume, see the June issue of the A.A.A.S. Bulletin.—S.W.

Too Late!

Several items of timely interest, which might have been printed in the A.A.A.S Bulletin, were received too late for publication. The deadline date for manuscript is the 20th of each month.—S.W.

Officers of the Association

President, Arthur H. Compton; *Permanent Secretary,* Forest R. Moulton; *General Secretary,* Otis W. Caldwell; *Treasurer,* C. Carroll Morgan; *Assistant Secretary,* Sam Woodley.

Executive Committee: Burton E. Livingston, *Chairman;* Roger Adams, Joseph W. Barker, Otis W. Caldwell, Walter B. Cannon, J. McKeen Cattell, Roy E. Clausen, Arthur H. Compton, Esmond R. Long, F. R. Moulton, and W. E. Wrather.

Membership in the Association

According to the Constitution, the objects of the Association are to promote intercourse among those who are cultivating science in different parts of America, to cooperate with other scientific societies and institutions, to give a stronger and more general impulse and more systematic direction to scientific research, and to procure for the labors of scientific men increased facilities and a wider usefulness. Members may reside in any country. A person desiring to become a member of the Association should fill in a membership application card that may be obtained from the Office of the Permanent Secretary and return it with his payment of $5.00 for one year's dues. Every member in good standing receives with his membership a subscription for either *Science* or *The Scientific Monthly.* Dues are for the fiscal year that begins October 1; the subscription begins the following calendar year. A member desiring to receive both journals concurrently may do so by paying $3.00 in addition to the regular dues. Members in good standing receive also, without extra charge, subscriptions for the A.A.A.S. Bulletin, and they may purchase symposia publications at prepublication and post-publication reduced prices.

A person who pays $100 may be elected a life member; sustaining members pay $1,000. Both classes are exempt from the payment of further dues but are entitled to all the privileges of membership.

An incorporated scientific society or institution or a public or incorporated library may become a member by paying the entrance fee of $5.00 in addition to the dues. Such institution members are entitled to the same privileges as individual members.

Members are encouraged to nominate for membership persons who desire to cooperate in carrying out the objects of the Association. Names may be sent to the Office of the Permanent Secretary at any time. In the letter of invitation to become a member of the Association the name of the person making the nomination is ordinarily mentioned.

Changes of Address

New addresses for the Association's records and for mailing the journals *Science* and *The Scientific Monthly,* as well as the A.A.A.S. Bulletin, should be in the Office of the Permanent Secretary, Washington, D. C., at least two weeks in advance of the date when the change is to become effective.